

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
24 October 2002 (24.10.2002)

PCT

(10) International Publication Number
WO 02/083254 A1

(51) International Patent Classification⁷: **A63F 3/12**

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(21) International Application Number: **PCT/EP02/03935**

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(22) International Filing Date: **9 April 2002 (09.04.2002)**

(25) Filing Language: **English**

(81) Designated States (*national*): AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK (utility model), SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(26) Publication Language: **English**

(30) Priority Data:
0101287-1 **11 April 2001 (11.04.2001)** **SE**

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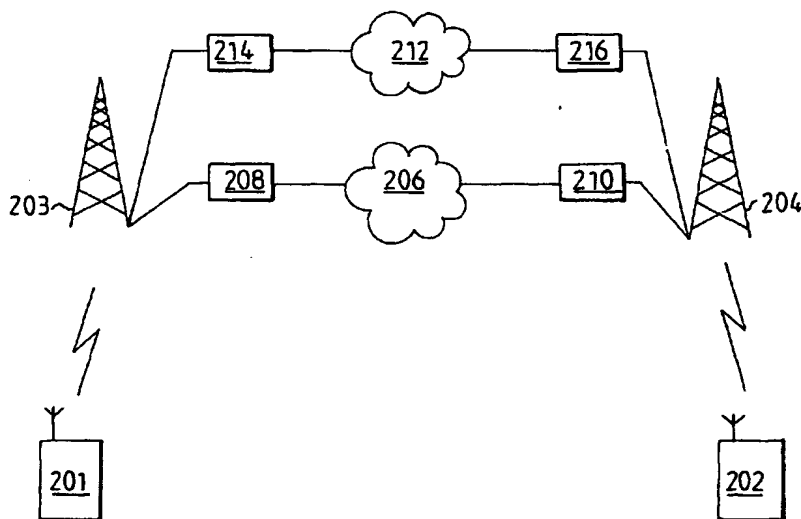
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent

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[Continued on next page]

(54) Title: **MOBILE TERMINAL AND METHOD RELATED TO MOBILE TERMINAL**



(57) Abstract: A mobile terminal (1; 101; 201, 202; 301, 303) comprising call means (3, 5; 105) for receiving and initiating telephone calls through a cellular network and multiplayer game means (17, 19; 109, 111) for participating in a game involving a second mobile terminal, further comprises- internal communication means (108) for transmitting an order to suspend the game to the game means when a call is received by the mobile terminal through the cellular network;- game communication means (17, 19; 109; 111) for communicating game information between the mobile terminal and the at least second terminal;- pause means (11) for pausing the game upon receiving the order to suspend the game in the game means, and for instructing the game communication means to forward the order to suspend the game to the second terminal.

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(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

Mobile Terminal and Method Related to a Mobile Terminal

Technical Field

The present invention relates to a mobile terminal and a method for use when playing games using a mobile terminal.

Description of Related Art

Multi-user games are becoming increasingly popular as communication facilities develop. For example, Nintendo Gameboy currently enables two-player games by connecting two Gameboy terminals by a cable.

There is a tendency today to include more functions in mobile telephones, apart from the traditional telephony functions. For example, many mobile telephones today comprise games that can be played by the user of the mobile telephone. Games for more than one person could be played using mobile telephones. Such games could be of the same kind as simple network games for computers or Internet games. The players will then communicate with each other using their respective mobile telephones.

This communication may take place through the standard cellular interface used by the mobile telephones for making calls. This will, however, be expensive for the users in the long run. Also, the power consumption is high for such connections. For terminals having infrared (IR) ports, such ports can be used for communicating game information, provided the IR ports can be aligned. In the future, most mobile terminals will probably comprise low-power transceivers or short-range transmission, such as Bluetooth, which can also be used for communicating game information. Using dual-mode telephones having, for example, both DECT and GSM capabilities, of course the DECT function can be used at a lower cost than GSM, when possible. Game information can also be sent via the short message service or other standard function for transmitting text, although this will make the game slow.

The use of mobile phones to play games means that the players do not have to carry an additional game terminal with them to be able to play. There is, however, always the risk that one of the players receives a phone call while playing, which means that his participation in the game will be interrupted. This might spoil the game session.

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Object of the Invention

It is an object of the present invention to enable a game involving two or more players, each using a mobile terminal to play, wherein the game will not be ruined if one player receives a call while playing.

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Summary of the Invention

This object is achieved according to the present invention by a mobile terminal comprising call means for receiving and initiating telephone calls through a call communications network according to a call communications standard and game means for playing a game on the mobile terminal, said mobile terminal being characterized in that the game means comprises multi-player game means for participating in a game involving a second mobile terminal, and that the mobile terminal further comprises

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- internal communication means for transmitting an order to suspend the game to the game means when a call is received by the mobile terminal through the call communications network;
- game communication means for communicating game information between the mobile terminal and the at least second terminal;
- pause means for pausing the game upon receiving the order to suspend the game in the game means, and for instructing the game communication means to forward the order to suspend the game to the at least second terminal.

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The object is also achieved according to the invention by a method for use in a mobile terminal comprising call means for receiving and initiating telephone calls through a call communications network according to a call communications stan-

dard and game means for playing a game on the mobile terminal, said game means comprising multi-player game means for participating in a game involving at least a second mobile terminal, said method comprising the following steps:

- receiving in the game means an indication that the game should be suspended;
- 5 - pausing the game upon receiving the order to suspend the game in the game means;
- informing the at least second terminal that the game is to be suspended.

10 In this way the user of the mobile terminal can answer any incoming calls, even while being involved in a game, without ruining the game.

In a preferred embodiment the mobile terminal comprises manual intervention means for transmitting the order to suspend the game to the game means, thus permitting the user to determine if and when the game should be suspended. The function may be used when the user wishes to suspend the game, even when there is no incoming call.

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Preferably, the mobile terminal further comprises resume means for resuming the game when the call is ended. It may also comprise manual means for indicating to other participants that the game should be resumed.

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In one embodiment of the invention the mobile terminal comprises means for acknowledging the indication that the game should be resumed. In this way, the other players participating in the game are given the opportunity to confirm that they are ready to resume the game.

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The game communication means should also be arranged to receive, from the game communication means of another mobile terminal, an order to suspend the game.

Brief Description of the Drawings

In the following the invention will be described in more detail by way of example only and with reference to the appended drawings, in which:

5 Figure 1 is a schematic physical representation of a mobile terminal used with the invention;

Figure 2 is a schematic logical representation of a mobile terminal used with the invention;

10 Figure 3 is an overview of a network with two terminals communicating with each other according to a first embodiment of the invention;

Figure 4 is an overview of a network with two terminals communicating with each other according to a second embodiment of the invention;

Figure 5 shows the signalling required to pause the game according to a preferred embodiment of the invention; and

15 Figure 6 shows the signalling required to resume the game according to a preferred embodiment of the invention.

Detailed Description of Embodiments

20 Figure 1 is a schematic physical representation of a mobile terminal 1 that may be used with the invention. The mobile terminal comprises an antenna 3 connected to a communication unit 5 for performing transmit and receive functions well known in the art, according to the mobile telephony standard that applies. The unit 5 in reality will probably be several units performing functions such as encoding/decoding, modulation/demodulation, etc. The communication unit 5 also communicates with a
25 microphone 7 and a loudspeaker 9 in ways well known in the art. The communication unit 5 is controlled by a processor 11, which also controls a display 13, on which messages to the user, or game data, may be displayed. The processor 11 in this example also comprises, or is connected to, a memory unit 15 comprising a game application program that can be played by the user of the mobile terminal 1
30 together with one or more players using other similar mobile terminals. Of course, a

separate processor could be used for controlling the game, but in this example, the processor 11 controls both the game functions and the communication functions performed by the communication unit 5.

5 The mobile terminal 1 also comprises a short-range communication unit 17, controlled by the processor 11, or by another processor if desired. The short-range communication unit 17 is connected to an antenna 19 and is used, among other things, for transmitting game data to other mobile terminals and receiving game data from these other mobile terminals. Instead of the antenna, an IR port may be used to
10 communicate with an IR port of another mobile terminal, provided the IR ports can be aligned.

Alternatively, a long-range communication facility may be used for transmitting game data, although this will generally be more expensive, consume more power
15 and involve longer delays than the short-range communication. For example, if a GSM telephone is used, General Packet Radio Service (GPRS) may be used for game data. In this case, the antenna 19 is not needed, as the terminal 1 can use the antenna 3 for communicating with the GPRS network. The terminal can still receive calls through the GSM network while having a GPRS connection.

20 The mobile terminal 1 also comprises manual input means 21, typically a keyset, to enable a user to enter commands, for example to indicate to other participants of an on-going game, that the game should be resumed.

25 Figure 2 is a logical representation of a mobile terminal 101 according to the invention. The mobile terminal 101 comprises an antenna 103 for receiving incoming calls to a call part 105 of the mobile terminal. The call part 105 also communicates with a game part 107 of the mobile terminal through internal communication means 108, for example, a serial link, general system bus or software backplane. The game
30 part 107 is responsible for the handling of game functions. The game part is con-

5 nected to a communication unit 109, in turn connected to an antenna 111, which may be the same as the first antenna 103, another antenna or another means of communication, such as an IR port, as explained in connection with Figure 1. The call part 105 of the mobile terminal 101 also communicates with a Subscriber Identity Module (SIM) unit 113, which handles subscriber data such as subscriber profile, but does not participate directly in the functions concerned by this invention.

Figure 3 shows two terminals connected through a cellular network. In this embodiment, GSM is being used for making and receiving telephone calls and GPRS is used for transmitting and receiving game data. A first 201 and a second 202 mobile terminal communicate with a first 203 and a second 204 base station, respectively. The base stations 203, 204 are connected both to a GSM network 206, through control means 208, 210, respectively, and to a GPRS network 212 through control means 214, 216, respectively. The terminals 201, 202 may of course be communicating with the same base station, but, are shown here as connected to different base stations to illustrate more clearly the use of two different networks, i.e. the GSM network 206 and the GPRS network 212, for call data and game data, respectively.

Game data and call data transmitted and received through the first mobile terminal 201 therefore pass between the mobile terminal and the first base station 203 through the same antenna on the mobile terminal. In the base station 203 the signals are separated and transmitted to the network 206, 212 for which they are intended. Similarly, the base station receives signals from both the GSM 206 and the GPRS 212 network and transmits these signals to the mobile terminal 201. When the first mobile terminal 201 is involved in a game with the second mobile terminal 202 through the GPRS network 212, therefore, any incoming calls to the first mobile terminal 201 through the GSM network 206 will be transmitted to the first mobile terminal 201 from the base station 203. Therefore, according to the invention, each of the mobile terminals 201, 202 comprises functions for pausing the game when a call is received and for requesting that the other terminal or terminals involved in

the game also pause the game at the same time. The signalling involved in this will be discussed in connection with Figure 5 below.

Figure 4 shows a first and a second terminal 301, 302, connected to a base station 303 and through the base station to a cellular network 306. Each of the mobile terminals 301, 302 is a mobile terminal as described in connection with Figures 1 and 2. In this case, however, short-range transmitters and antennas in the mobile terminals 301, 302 communicate with each other. Of course the terminals may be connected to different base stations, although if they use the same operator they will probably be connected to the same base station, because of the relatively short distance between them when the short-range transmitter is used. If necessary, a repeater 308 or similar unit may be used to enable a greater distance between the terminals 301, 302.

Game data transmitted and received through the first mobile terminal 301 are received in the mobile terminal by a first antenna 310. Call data transmitted and received through the first mobile terminal are transmitted and received through a second antenna 312. The second mobile terminal comprises corresponding antennas 310', 312'. When the first mobile terminal 301 is involved in a game with the second mobile terminal 302 through the second antennas 312, 312', therefore, any incoming calls to the first mobile terminal 301 through the cellular network 306 will be transmitted to the first mobile terminal 301 from the base station 303. Therefore, according to the invention, each of the mobile terminals 301, 302 comprises functions for pausing the game when a call is received and for requesting that the other terminal or terminals involved in the game also pause the game at the same time. The signalling involved in this will be discussed in connection with Figure 5 below.

Of course, to be involved in a game together, the mobile terminals need to have in common the communication standard used for communicating game data, that is, in Figure 1, GPRS and in Figure 2, Bluetooth. Obviously, as long as they can commu-

nicate in this way, the call communication may be with different networks and if desired even with networks having different standards.

Figure 5 shows the signalling that is performed when one player involved in a game using mobile terminals as discussed above receives a phone call. The units participating are:

BS: Base station

MT1: The call handling function of the mobile terminal receiving the call (the first mobile terminal)

10 GP1: The game playing function of the first mobile terminal

GP2: The game playing function of one or more further mobile terminals participating in the game with MT1

In the first step, the mobile terminal receives the phone call from the base station, in the way common in the art. In step 2, the call handling function of the first mobile terminal signals to the game playing function of the first mobile terminal that the game should be suspended. In step 3, the game playing function of the first mobile terminal signals to the other terminal or terminals involved in the game that the game should be suspended. Step 4 is an optional step in which the other terminal or terminals acknowledge receipt of the signal and having suspended the game. In step 5 the game playing function of the first mobile terminal acknowledges to the call handling function of the first mobile terminal that the game has been suspended. The signalling in steps 3 and 4 takes place over the interface used for game playing, i.e., in Figure 1 it would go through the GPRS network and in Figure 2 through Bluetooth.

It may also be possible to suspend the game for another reason than an incoming call. In this case, a manual action from the user of the first terminal is needed, instead of step 1 above. For example, the user can press a certain key, or combination

of keys, on his terminal to inform the game handling function that the game should be suspended. Steps 3, 4 and 5 remain as above.

Figure 6 shows the steps performed when a game, once paused, should be resumed.

5 The units involved are the same as in Figure 5, except that the base station does not participate.

In step 6 the call ends, and this is signalled from the call handling function of the first mobile terminal to the game handling function of the first mobile terminal, or
10 manually by the user to the game handling function. The latter may be the case if the user suspended the game manually, or if the game should not automatically be resumed once the call ends. In step 7 the game handling function of the first mobile terminal signals to the other mobile terminal involved in the game that it is ready to resume the game. Step 8 is an optional step in which the other terminal or terminals
15 acknowledge that they are ready to resume the game. A delay of, for example, a few seconds, may be added to allow all users to get ready to continue the game. If step 8 is not used the game may simply be resumed shortly after step 7. Alternatively, acknowledgement may be needed from at least a certain number of the terminals, or from all of them. Acknowledgement may be automatic or manual action from the
20 user of each terminal may be required to confirm that each user is ready to continue the game.

Claims

1. A mobile terminal (1; 101; 201, 202; 301, 303) comprising call means (3, 5; 105) for receiving and initiating telephone calls through a call communications network (206; 306) according to a call communications standard and game means (11, 15, 17, 19; 107) for playing a game on the mobile terminal, characterized in that

the game means comprises multi-player game means (17, 19; 109, 111) for participating in a game involving at least a second mobile terminal, and that the mobile terminal further comprises

- internal communication means (108) for transmitting an order to suspend the game to the game means when a call is received by the mobile terminal through the call communications network;
- game communication means (17, 19; 109; 111) for communicating game information between the mobile terminal and the at least second terminal;
- pause means (11) for pausing the game upon receiving the order to suspend the game in the game means, and instruction means (11) for instructing the game communication means (17, 19; 109; 111) to forward the order to suspend the game to the at least second terminal.

2. A mobile terminal according to claim 1, further comprising manual intervention means (21) for transmitting the order to suspend the game to the game means (11, 15, 17, 19; 107).

3. A mobile terminal according to claim 1 or 2, further comprising resume means (11) for resuming the game when the call is ended.

4. A mobile terminal according to claim 4, further comprising manual means (21) for indicating to other participants that the game should be resumed.

5. A mobile terminal according to claim 5, further comprising means (17, 19; 109, 111) for acknowledging the indication that the game should be resumed.

5 6. A mobile terminal according to any one of the preceding claims, wherein the game communication means is arranged to receive, from the game communication means of another mobile terminal, an order to suspend the game and forward said received order to the pause means.

10 7. A method for use in a mobile terminal comprising call means for receiving and initiating telephone calls through a call communications network according to a call communications standard and game means for playing a game on the mobile terminal, said game means comprising multi-player game means for participating in a game involving at least a second mobile terminal, said method comprising the following steps:

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- receiving in the game means an indication that the game should be suspended;
 - pausing the game upon receiving the order to suspend the game in the game means;
 - informing the at least second terminal that the game is to be suspended.

20 8. A method according to claim 7, wherein the indication is made automatically by the call means when a call is received to the mobile terminal.

9. A method according to claim 7, wherein the indication is made manually by the user.

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10. A method according to any one of the claims 7-9, further comprising the step of transmitting from the at least second terminal to the mobile terminal a confirmation signal that the game has been paused.

11. A method according to any one of the claims 7-10, further comprising the steps of signalling from the game means to said at least second terminal when the game is to be resumed and then resuming the game.

5 12. A method according to claim 11, further comprising the step of signalling from said at least one other terminal to the game means to confirm that the game can be resumed before resuming the game.

10 13. A mobile terminal system having at least a first and a second mobile terminal (1;101;201,202;301,303), each comprising call units (3,5;105), which receive and initiate telephone calls through a call communications arrangement (206;306) according to a first communications standard, and each comprising game means (11;15,17,19;107) adapted for playing a game on the mobile terminal, characterized by

- 15 • a game communications arrangement (212;308), to which each mobile terminal is connectable;
- multi-player game unit, as the game means, in each mobile terminal, the multi-player game units in at least two mobile terminals participating in a common game through the game communications arrangement (212;308) when connected;
- 20 • internal communications means (108) in each mobile terminal adapted to transmit an order to suspend an on-going game to its game means when a call is received by the mobile terminal through the call communications arrangement and to communicate the suspension information to the other mobile terminal(s) participating in the on-going game;
- 25 • pause means (11) in each mobile terminal, which pauses the game upon receiving the suspension information from the other mobile terminal(s).

14. A mobile terminal system according to claim 13, characterized by

manual intervention means (21) in each mobile terminal for transmitting the order to suspend the game to the game means (11,15,17,19;107).

5 15. A mobile terminal system according to claim 13 or 14, characterized by resume means (11), which is adapted to detect end of call and then resume the game.

10 16. A mobile terminal system according to anyone of the claims 13 to 15, characterized by manual means (21) to enable a user to enter commands to indicate to other participants of an on-going game that the game should be resumed.

15 17. A mobile terminal system according to anyone of the claims 13 to 16, characterized by acknowledge means (17,19;109,111) sensitive to an information from another mobile terminal that the game should be resumed and acknowledge this information.

20 18. A mobile terminal system according to anyone of the claims 13 to 16, characterized by the game means (11,15,17,19;107) through the game communications arrangement (212;308) is adapted to receive from another mobile terminal an order to suspend the game and forward the received order to the pause means (11).

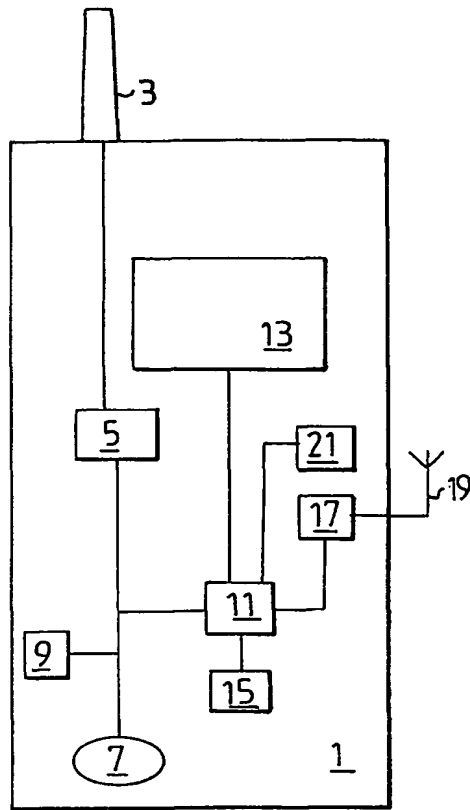


FIG. 1

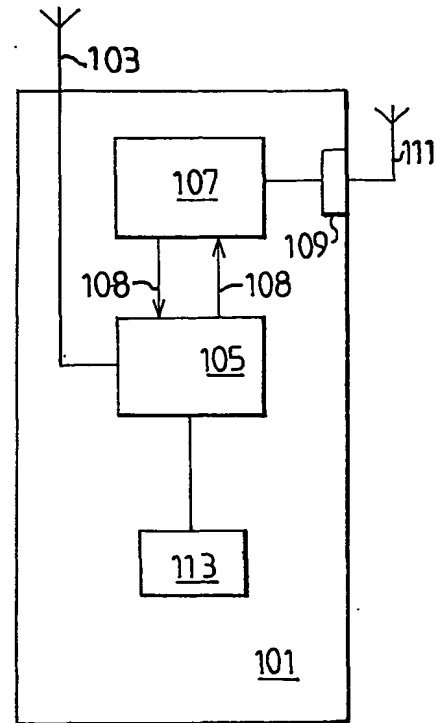


FIG. 2

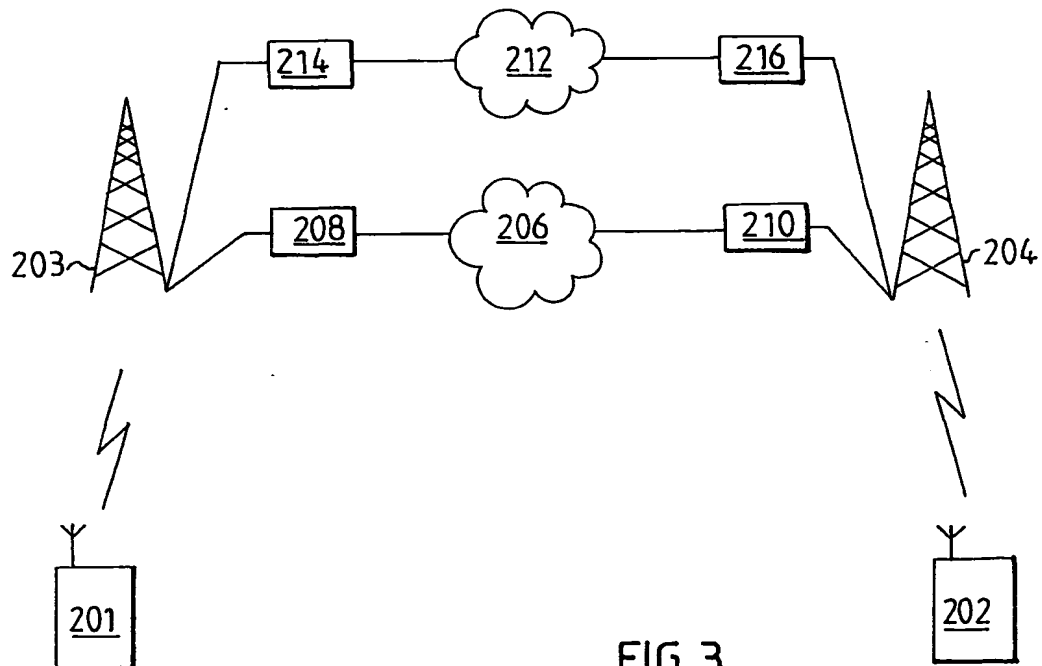


FIG. 3

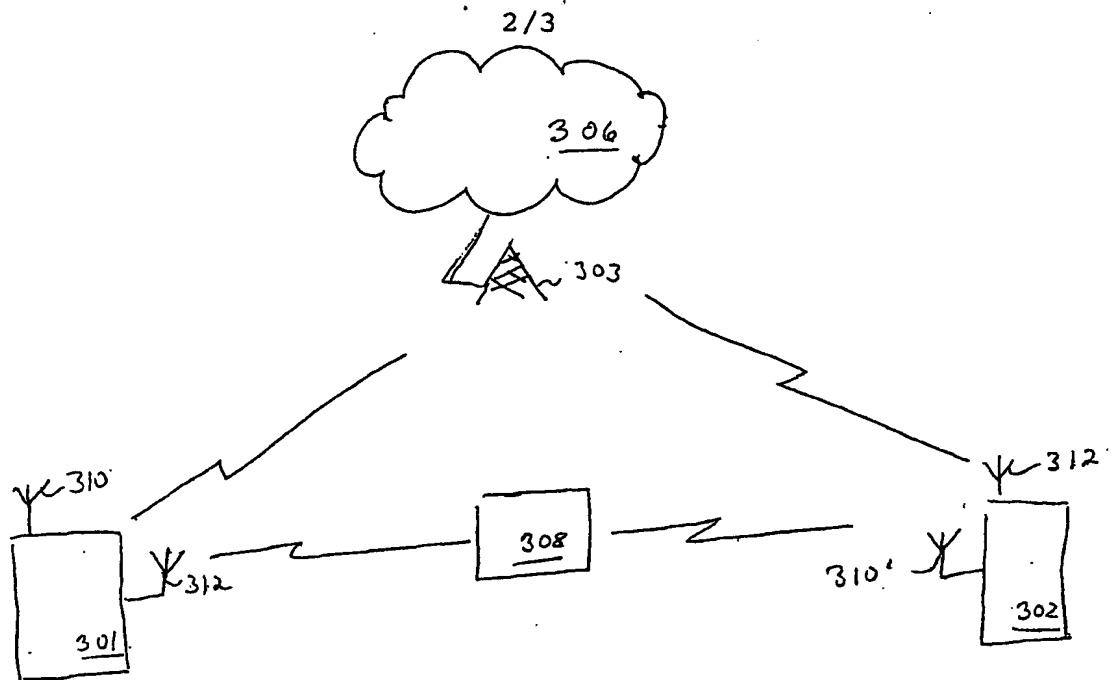


Fig. 4

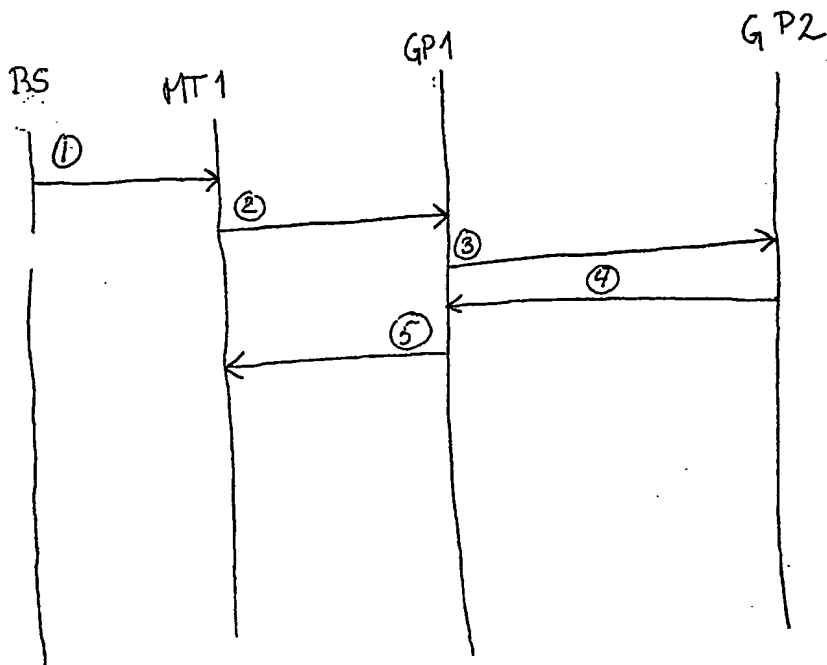


Fig. 5

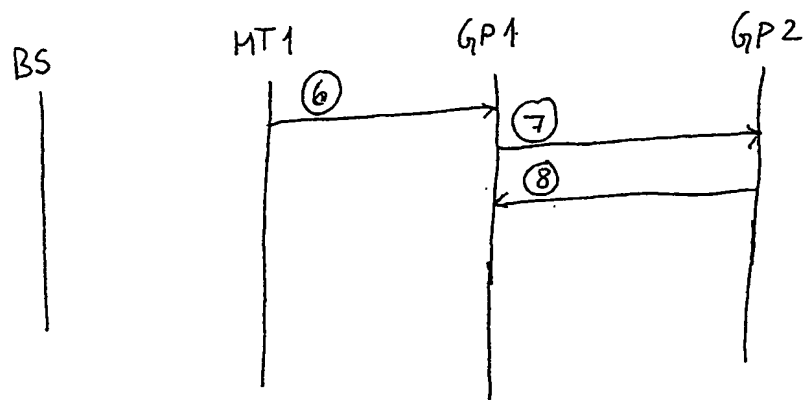


Fig. 6

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 02/03935

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A63F13/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A63F H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 066 867 A (NOKIA CORP) 10 January 2001 (2001-01-10)	1, 13
A	paragraph '0009!	7
	paragraphs '0016!, '0017! paragraph '0022! - paragraph '0024! paragraph '0031! paragraph '0033! - paragraph '0036! paragraph '0041!; figure 4	
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☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

28 August 2002

Date of mailing of the international search report

05/09/2002

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 02/03935

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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